

THE INVENTION CLAIMED IS:

1. A method of forming an integrated circuit comprising:  
providing a semiconductor substrate;  
forming a gate dielectric on the semiconductor substrate;  
5 forming a gate over the gate dielectric;  
forming source/drain junctions in the semiconductor substrate;  
forming ultra-uniform silicides on the source/drain junctions;  
depositing a dielectric layer above the semiconductor substrate; and  
forming contacts in the dielectric layer to the ultra-uniform silicides.
- 10 2. The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicides uses a very low power deposition technique using  
a power level below 500 watts direct current.
3. The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicides uses an extra slow rate of deposition of a silicide  
15 metal below 7.0 Å per second.
4. The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicides forms an ultra-thin thickness of a silicide metal of  
not more than 50 Å thick.
5. The method as claimed in claim 1 wherein:  
20 depositing the dielectric layer deposits a dielectric material having a dielectric  
constant selected from a group consisting of medium, low, and ultra-low  
dielectric constants.
6. The method as claimed in claim 1 wherein:  
forming the contacts to the ultra-uniform silicides uses materials selected from a  
25 group consisting of tantalum, titanium, tungsten, copper, gold, silver, an alloy  
thereof, a compound thereof, and a combination thereof.
7. A method of forming an integrated circuit comprising:  
providing a silicon substrate;  
forming a gate oxide on the silicon substrate;  
30 forming a polysilicon gate over the gate oxide;  
forming source/drain junctions in the silicon substrate;

forming an ultra-uniform nickel silicide having no variations in thickness greater than 3% of the overall thickness on the source/drain junctions and on the gate; depositing a dielectric layer above the silicon substrate; and forming contacts in the dielectric layer to the ultra-uniform nickel silicide.

5           8.       The method as claimed in claim 7 wherein:

forming the ultra-uniform nickel silicide uses a vapor deposition using a power level below 400 watts direct current.

9.       The method as claimed in claim 7 wherein:

forming the ultra-uniform nickel silicide uses an extra slow rate of deposition of  
10           nickel below 6.8 Å per second; and  
additionally comprising:

an annealing of the nickel to the ultra-uniform nickel silicide.

10.       The method as claimed in claim 7 wherein:

forming the ultra-uniform nickel silicide uses an ultra-thin thickness of nickel of not  
15           more than 50 Å thickness.

11.       The method as claimed in claim 7 wherein:

depositing the dielectric layer deposits a dielectric material having a dielectric constant below 4.2.

12.       The method as claimed in claim 7 wherein:

forming the contacts to the ultra-uniform silicides uses materials selected from a  
20           group consisting of tantalum, titanium, tungsten copper, gold, silver, an alloy thereof, a compound thereof, and a combination thereof.

13.       An integrated circuit comprising:

a semiconductor substrate having source/drain junctions;

25           a gate dielectric on the semiconductor substrate;

a gate over the gate dielectric;

ultra-uniform silicides on the source/drain junctions;

a dielectric layer above the semiconductor substrate; and

contacts in the dielectric layer to the ultra-uniform silicides.

30           14.       The integrated circuit as claimed in claim 13 wherein:

the ultra-uniform silicides is an ultra-thin thickness of a silicide metal of not more than 50 Å thick.

15. The integrated circuit as claimed in claim 13 wherein:  
the dielectric layer deposits a dielectric material having a dielectric constant selected  
from a group consisting of medium, low, and ultra-low dielectric constants.

16. The integrated circuit as claimed in claim 13 wherein:  
the contacts to the ultra-uniform silicides are of materials selected from a group  
consisting of tantalum, titanium, tungsten, copper, gold, silver, an alloy  
thereof, a compound thereof, and a combination thereof.

17. An integrated circuit comprising:  
a silicon substrate having source/drain junctions;  
a gate oxide on the silicon substrate;  
a polysilicon gate over the gate oxide;  
an ultra-uniform nickel silicide on the source/drain junctions and the polysilicon gate,  
the ultra-uniform nickel silicide having no variations in thickness greater than  
3% of the overall thickness;  
a dielectric layer above the silicon substrate; and  
contacts in the dielectric layer to the ultra-uniform nickel silicide.

18. The integrated circuit as claimed in claim 17 wherein:  
the ultra-uniform nickel silicide is an ultra-thin thickness of a silicide metal of not  
more than 50 Å thickness.

19. The integrated circuit as claimed in claim 17 wherein:  
the dielectric layer is a dielectric material having a dielectric constant below 4.2.

20. The integrated circuit as claimed in claim 17 wherein:  
the contacts to the ultra-uniform silicides are of materials selected from a group  
consisting of tantalum, titanium, tungsten copper, gold, silver, an alloy  
thereof, a compound thereof, and a combination thereof.